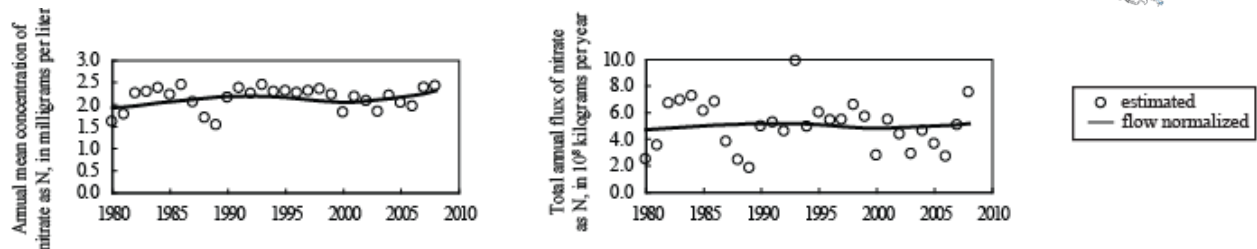


Mississippi River at Thebes, IL

Flow-normalized nitrate concentration and flux

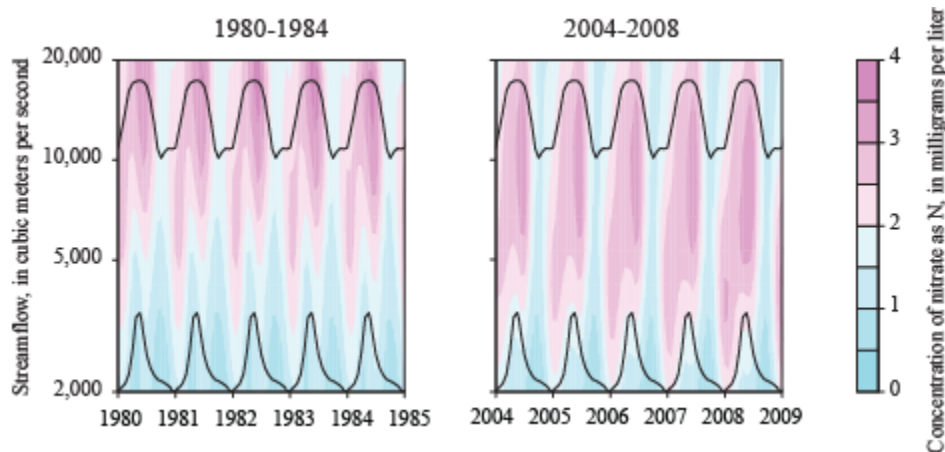
Percentage changes in flow-normalized nitrate concentration and flux between 1980 and 2008 were 20 and 9%, respectively, at Mississippi River at Thebes, IL. Flow-normalized concentration and flux increased during the 1980s, decreased during the 1990s, and then increased after 2000.



EXPLANATION: Estimated concentration and flux are strongly influenced by changes in climate and streamflow. For example, concentration and flux of nitrate are different during floods than during droughts. Flow-normalized concentration and flux are independent of changes in streamflow, so they can provide greater insight into the effects of conservation practices and other changes in the watershed.

Comparison of nitrate concentrations over time and with streamflow

Nitrate concentrations at Mississippi River at Thebes increased between the early 1980s and mid 2000s at low and moderate streamflows but decreased at high streamflows. Increases at low and moderate streamflows were greater than decreases at high streamflows. Notably, concentrations decreased at high streamflows in the spring, when nitrate fluxes were highest.



EXPLANATION: These contour plots show model estimates of concentration as a function of time and streamflow for two 5-year snapshots in time—an early period from 1980 to 1984 and a recent period from 2004 to 2008. Any vertical line shows how concentration would have varied with streamflow on a particular day of a particular year; any horizontal line shows how concentration would have varied over time (seasonally and annually) at a particular streamflow. Because the probability distribution of streamflow changes from day to day, smoothed estimates of the 5th and 95th percentiles of streamflow on each day are plotted as black lines.

Map of sampling location:

http://waterdata.usgs.gov/nwis/nwismap/?site_no=07022000&agency_cd=USGS

Link to water-quality data:

http://infotrek.er.usgs.gov/nasqan_query